ECF No. 281-74, Exhibit 67 to Plaintiffs' Mot. for Class Certification

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Exhibit 67

UNITED STATES DISTRICT COURT FOR THE

NORTHERN DISTRICT OF CALIFORNIA

DZ Reserve and Cain Maxwell (d/b/a Max Martialis) individually and on behalf of others similarly situated, Plaintiffs, v. FACEBOOK, INC., Defendant.	Case No. 3:18-cv-04978

EXPERT REPLY REPORT OF ARMANDO LEVY, Ph.D.

March 23, 2021

HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY

I. INTRODUCTION

1. My name is Armando Levy. I previously prepared an expert report in this matter in which I estimated damages to the class from Facebook's alleged misrepresentation of its Potential Reach metric.[1] Since finishing that report, Facebook provided additional data on the budgets of advertisers from 2014 to 2019, provided other information and sponsored three rebuttal reports in this matter. Counsel for the purported class members asked me to respond to the rebuttal reports from the two experts who addressed the analysis in my earlier report.

2. A copy of my current CV including my testimony and publications was attached as Appendix A to my earlier report and remains largely current.[2] The compensation rates set forth in my Prior Report remain unchanged. As before, neither my compensation nor that of The Brattle Group is contingent on my findings or the outcome of this proceeding.

3. After reviewing the analyses in the expert reports of Facebook's rebuttal experts, I continue to believe that damages can be reliably calculated based on common, class-wide evidence.

4. To prepare this report, I reviewed supplemental data provided by Facebook through discovery, academic sources, and the expert Rebuttal reports of Professor Catherine Tucker and Professor Steven Tadelis. A list of documents that I relied upon in preparing this expert report is attached as Appendix A. I reserve the right to revise my analysis and opinions should additional relevant information be provided to me.

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[1] Expert Report of Armando Levy, Ph.D. in Support of Class Certification, December 22, 2020 [Case No. 3:18-cv-04978] (hereafter my "Prior Report")

[2] Since I submitted my Original Report, I was deposed in the *Advocate for Cleaner Air, et. al. v. Puget Sound Energy* matter. Otherwise, my curriculum vitae remains current.

II. PROFESSOR TUCKER'S REPORT

5. Professor Tucker points out that advertisers received value from their advertisements on Facebook's platforms.[3] She states that I ignore this value, which is incorrect. The source of economic damages in this matter stems from Facebook obtaining a price premium through the misrepresentation of Potential Reach to advertisers. The price per 1000 impressions is the market value (i.e., market price) for advertising at the time of purchase on Facebook and the change in the market value due to Facebook's alleged misrepresentations constitutes damages for the class members. That is, the price per 1000 impressions given *truthful* disclosure of Potential Reach represents the economic market value of advertising on Facebook's platforms.

6. Professor Tucker discussed advertising objectives as an important part of the advertisers' decision process.[4] However, she provides no empirical evidence that advertisers with different objectives differ in their preferences for Potential Reach.[5]

7. Professor Tucker's examples or case studies[6] are irrelevant for the calculation of damages and do not represent the economic value of advertisements but a post-purchase benefit. Advertisers who ran successful campaigns would also be damaged by Facebook's alleged misrepresentations because they overpaid for their advertisements.

8. A key aspect of Facebook's auction is that the price that an advertiser pays for placing an ad to a Facebook user is determined by the bids of *other* (would be) advertisers.[7] Therefore, reliance on the Potential Reach metric by a particular advertiser is not a prerequisite for suffering damage. What is relevant is the aggregate response from the

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[3] Rebuttal Expert Report of Catherine Tucker, Ph.D., March 3, 2020 [Case No. 3:18-cv-04978] (hereafter the "Tucker Report") § V.B.1.

[4] Tucker Report, ¶ 14, 56, 59

[5] I can identify the number of ads on Facebook's platform that used each objective. *See* Appendix B.

[6] Professor Tucker describes the examples of Parachute, AirBnB and an academic working paper.

[7] "In Dr. Roughgarden's simulation, that deviation can benefit the advertiser because they generally receive more impressions while their price (***which depends on other advertisers' bids rather than their own***) remains relatively unchanged." [emphasis added] Expert Rebuttal Report of Steven Tadelis, Ph.D., March 3, 2020 [Case No. 3:18-cv-04978] (hereafter the "Tadelis Report"), ¶203

pool of advertisers who received exaggerated Potential Reach estimates. Professor Roughgarden's simulation demonstrates that given the distribution of budget changes estimated from Professor Allenby's analysis, truthful disclosure of Potential Reach would result in lower CPM for all of Facebook's advertisers.

9. Professor Tucker also claims that the lack of correlation between the raw Potential Reach numbers and budgets "calls into question" whether advertisers would reduce their budgets if the Potential Reach inflation were eliminated.[8] That is incorrect. Professor Allenby's conjoint survey analysis shows that larger Potential Reach numbers for a given targeting criteria have a statistically significant impact on budget allocations.[9] Furthermore, Professor Allenby's sensitivity analysis shows that the impact of a Potential Reach inflation as measured by partworths does not vary based on the raw Potential Reach (audience size).[10] Thus, Professor Tucker's analysis is inconsistent with the proper application of the results of Professor Allenby's conjoint survey on a proportional basis.[11]

III. PROFESSOR TADELIS' REPORT

10. Professor Tadelis prepared an expert report that concludes, among other things, that Professor Roughgarden's auction simulation is not an equilibrium, and hence that my damages calculation do not reflect an equilibrium outcome.

11. Professor Tadelis states that Professor Roughgarden's simulation does not "account for incentives" which he illustrates through an example in which he hypothesizes a particular set of circumstances ("dynamics") for which the hypothesized counterfactual behavior is not an equilibrium.[12]

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[8] Tucker Report, ¶108.

[9] Allenby Report, Table 3

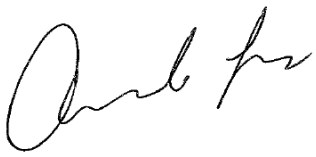
[10] Allenby Report, Table 5

[11] Professor Allenby measures the inflation of 33.3% for the United States prior to targeting and 10% for Potential Reach after targeting.

[12] Tadelis Report, ¶202

12. Additionally, Professor Tadelis states that Professor Roughgarden's simulation ignores the impact of lower CPM on advertiser budgets.[13] From an economic standpoint, Professor Roughgarden's auction simulation properly calculates the change in market prices by incorporating both demand and supply. Professor Tadelis speculates about second-order effects. However, the difference these effects would have (if any) would be minimal. The coefficient on expected CPM in Professor Allenby's regression equation measures the effect of expected CPM on budget allocations. Hence, if advertisers anticipate a co-movement of CPM and Potential Reach by internalizing that other advertisers in aggregate will reduce their budgets, then we can calculate the size of this effect on budgets. The coefficient for expected CPM from Professor Allenby's regression is -0.19, Facebook's average CPM is about [redacted] and Facebook represents 43 percent of ad budgets. Professor Roughgarden's change in CPM is 3.4 percent. Hence the effect for these values is at most 0.15 percent [redacted] of the Facebook budget, so the price premium would be 3.3 percent instead of 3.4 percent.

13. Should new information become available to me, I reserved the right to update my opinion accordingly.



Armando Levy, Ph.D.

March 23, 2021

[13] Tadelis Report, §IX.C.4.

APPENDIX A: DOCUMENTS RELIED UPON

Expert Reports

- Expert Report of Catherine Tucker
- Expert Report of Stephen Tadelis

Academic Articles, Books and Public Press

- Tesler, L.G.(1964) "Advertising and Competition" *Journal of Political Economy*, Vol. 72(6): 537-562
- Masih, R. (1999) "An Empirical Analysis of the Demand for Commercial Television Advertising" *Applied Economics*, Vol. 31: 149-163

Facebook Documents & Data

- FB-SINGER-0041 (custom audience file)
- FB-SINGER-0042 (all_ads_details for October 2016)
- FB-SINGER-0043 and 192 related files listed therein (new budget data)

Other

- All documents listed in my Prior Report

APPENDIX B: ADVERTISER OBJECTIVES BY PLATFORM TARGET

Total Ads and Revenue by Ojective (Aug 2014 - May 2019)

Ad Objective	Total Ads [1]	Total Revenue [2]
[redacted]		

Sources and Notes:
FB-SINGER-026 and FB-SINGER-042

Facebook Ad Objective and Targeting: Instagram and Audience Network Shares

	Ads				***Revenue***			
	Total	Includes Instagram Target (%)	Includes Audience Network Target (%)	Excludes Instagram and Audience Network Target (%)	Total	Includes Instagram Target (%)	Includes Audience Network Target	Excludes Instagram and Audience Network Target (%)
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
[redacted]								

Sources and Notes:
FB-SINGER-026 and FB-SINGER-042
Instagram only begins tracking starting late June 2015.